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TITLE: Automated Neuropsychological Assessment Metrics Version 4 (ANAM4): Examination of  
Select Psychometric Properties and Administration Procedures

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## INTRODUCTION

The ability to accurately and efficiently monitor neurocognitive status of U.S. warfighters under diverse operational and experimental conditions is of critical importance to the ongoing mission and network-centered initiatives of the U.S. military. The Automated Neuropsychological Assessment Metrics Version 4 (ANAM4) is a computer-assisted tool for evaluating neurocognitive performance with demonstrated efficacy for application in diverse military operational and research testing scenarios. The primary objective of this multi-study project is to examine select psychometric and administration properties of the ANAM4. This project includes four studies that will 1) examine common use practices and determine the effect of specific administration procedures on ANAM4 performance, 2) assess the test-retest reliability of individual ANAM4 tests, and 3) examine the validity of the ANAM4 mood scale, and 4) develop adverse, representative military normative dataset.

## BODY

This project was funded 01 December 2007.

Progress made during the current funding period (01 December 2007 - 30 November 2008), corresponding to tasks 1-4, is described below.

The approved study timeline and Statement of Work (SOW) is presented in Table 1.

**TABLE 1: STATEMENT OF WORK: *Study Timeline***

<b>Year 1</b>	<b>Months 1-2</b>	<b>Task 1</b>	Plan and finalize logistics for Phase I (studies 1-3)
	<b>Months 3-12</b>	<b>Task 2</b>	Subject recruitment, data collection and data management for Study 1
<b>Year 2</b>	<b>Months 13-14</b>	<b>Task 3</b>	Perform data analyses for Study 1
	<b>Months 15-24</b>	<b>Task 4</b>	Subject recruitment, data collection and data management for Study 2 & 3
		<b>Task 5</b>	Plan and finalize logistics for Phase II (study 4)
		<b>Task 6</b>	Subject recruitment, data collection and data management for Study 4
<b>Year 3</b>	<b>Months 25-36</b>	<b>Task 7</b>	Perform data analyses for Studies 2 & 3
		<b>Task 8</b>	Preparation of journal manuscript(s) for Studies 1-3
		<b>Task 9</b>	Continue recruitment, data collection and data management for Study 4
<b>Year 4</b>	<b>Months 37-48</b>	<b>Task 10</b>	Complete data collection for Study 4; Perform data analyses for Study 4
		<b>Task 11</b>	Prepare Study 4 manuscript for peer review
		<b>Task 3</b>	Preparation of final project

Initial USARIEM Human Use Review Committee (HURC) approval for this project was received on 14 June 2007 (initial approval pending modification given on 23 May 2007). However, approval for Study 4 (normative data collection) was tabled on 11 January 2008 by the

HURC due to the lack of a confirmed site(s) for data collection. Review of Study 4 by the HURC will be conducted at a later date when locations for data collection are confirmed and necessary approvals are obtained.

### **Task 1 (Month 1-2)**

#### **Plan and finalize logistics for Phase I – COMPLETED**

All logistical aspects for HURC approved studies (Studies 1-3) have been confirmed. Recruitment procedures, equipment, testing facilities, and other data collection elements are operating and/or being carried out smoothly and as anticipated.

### **Task 2 (Month 3-12)**

#### **Subject recruitment, data collection and data management for Study 1 – IN PROGRESS**

Subject recruitment, data collection and data management are ongoing and on track. Data management is current. Recruitment of both Human Research Volunteers and Civilians has been effective and efficient. Study 1 is examining the impact of practice and individual vs group session administration. Our recruitment goal for Study 1 is 99 participants total or approximately 30 participants per each of the 3 conditions (individual, group testing; practice, no practice; single, double session). The following table (Table 2) shows our recruitment thus far.

**TABLE 2. Study 1 recruitment**

		# of participants recruited
<b>Condition 1</b>	individual	31
	group	11
<b>Condition 2</b>	practice	31
	no practice	8
<b>Condition 3</b>	single session	31
	double session	2

- Note that many participants consented to participating in more than one condition and/or more than one study, thus increasing sample numbers above expected recruitment goals in certain cells.

### **Task 3 (Month 13-14) Perform Data Analysis for Study 1 – IN PROGRESS**

With data collection still in progress, data analyses have not yet been performed. However, data management procedures are ongoing, including entry of data into Excel spreadsheets and SPSS data files, as well as checking of data, in preparation for data analysis.

### **Task 4 (Months 15-24)**

#### **Subject recruitment, data collection and data management for Studies 2 & 3 – IN PROGRESS**

Recruitment and data collection for Studies 2 & 3 are occurring concurrently with Study 1, given the favorable recruitment and study support. Study 2 is examining aspects of test-retest intervals and Study 3 is examining the validity of the ANAM4 mood scale. As with Study 1, our recruitment goal for Study 2 is 99 participants, roughly 30 participants per test-retest condition (days 1 & 7; days 1 & 30; 7 consecutive day retest). Table 3 presents the recruitment progress

for Study 2. The recruitment goal for Study 3 is 50 participants; we have currently recruited 32 participants.

**TABLE 3. Study 2 recruitment**

		# of participants recruited
<b>Condition 1</b>	1 and 7	5
<b>Condition 2</b>	1 and 30	2
<b>Condition 3</b>	7 consecutive	17

## **KEY RESEARCH ACCOMPLISHMENTS**

Key research accomplishments during the current study period include:

- Data collection is on track for Study 1 and ahead of schedule for Studies 2 & 3. Nearly 66% of the total required sample for Study 1, 24% for Study 2, and 64% for Study 3 have been completed.
- Manuscript for Study 3 is in preparation as we near completion of data collection for this study.
- Continuing Review report was reviewed and approved by the USARIEM HURC (01 July 2008)

## **REPORTABLE OUTCOMES**

### **1. Reports, manuscripts, abstracts**

None to report at present.

### **2. Degrees and research training opportunities**

One bachelor's level student (currently applying for graduate school) and two undergraduate students have assisted in data collection for this project.

### **3. Collaborative funding applications related to work supported by this award**

None currently.

### **4. Related projects and collaborations initiated**

Drs. Proctor and Heaton are also currently initiating another study focused of the ANAM4. Specifically, plans are underway to examine the validity of the ANAM4TBI task battery in a case-control study design involving mild TBI patients and controls (USARIEM #H09-08).

## **CONCLUSIONS**

There has been significant progress in this initial funding period. We anticipate continued success in subject recruitment and testing procedures.

Data from this project will add significantly to the development and use of ANAM4 and subsequent versions of the neurocognitive assessment tool, as well as provide useful information regarding use and of this assessment tool and interpretation of testing result within a military population.